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# TEACHER'S GUIDE:

COMPANION TO

BARTHOLOMEW'S

## PRIMARY-SCHOOL DRAWING-CARDS.

SERIES THREE.

FOR TEACHERS AND STUDENTS USING BARTHOLOMEW'S DRAWING-CARDS.

BY

MISS J. H. STICKNEY.

NEW YORK:
WOOLWORTH, AINSWORTH, AND COMPANY.
1873.

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# INTRODUCTION.

THIS series of lessons completes the slate-work, or elementary course in drawing.

It is the earnest desire of the author that all teachers who use these card-exercises may understand his aim in them, and, making it their own, work with intelligence and enthusiasm. Attention is called to the fact that it is not the beginning, in simpler form, of the Drawing-Book Series, but a preparatory course for the three years of childhood, — a means of putting the child into possession of his powers, so that recognizing in the subject a value and a beauty, and in himself a measure of ability, he may be encouraged afterward to begin at the beginning of the science, and train mind and body for higher power. This beginning is made in the *Book Series*, and carried on in consecutive steps according to the laws and demands of the subject. In the elementary or primary work, the philosophy is a different one. It follows the maxim of Pestalozzi, that, in early education, it is not the order of the subject that we should make our guide, but the nature and apti-

tude of the child to be taught; and also the widely-approved wisdom of the French saying, that first branches of knowledge are instrumentary to the child's development.

We believe it is a kind of native instinct to teach children in this way; giving them, while they are yet children, the little they can take of many things whose depth of meaning is far beyond their powers, provided only that the instruction given interests them, and follows the line of their curiosity and desire.

It is for this reason that the exercises of this series for childhood have been made as pleasing and beautiful as the necessary regard for simplicity will allow.

At five years of age the average child cannot draw any thing that has beauty correctly. The arrangement of dots and lines, with a gradual rise to symmetrical figures, seems to be co-ordinate to, while it affords the best of training for, his erratic powers; but, because he is a child, he will soon weary of the training, if it has not *some* fruits which mature in childhood.

With no training at all, the whole race of children made pictures, and very fair pictures too, of things we should not dare to require them to undertake. The child at the seaboard makes ships before he learns to write his name; and children everywhere draw carts and horses, houses and people, with interest and profit to themselves, if not of value as drawings. It is the object of this culminating series of the primary course to recognize and help this natural want, and so mature some practical gain which children will

themselves rejoice in from the three-years' practice. The ability gained will not lie dormant till the time comes for these examples to have their place in a scientific series, but will grow while the pupil carries on a side-course for amusement, fed by all that he gains in his regular work.

In teaching the lessons of Series No. 3, bear in mind that pupils are to be developed in the direction of enthusiasm for drawing, with the necessary observation of forms that must accompany it, and to get as much of *accuracy* as is possible. It is the business of the work that follows to demand precision.

Two kinds of lessons will grow out of this consideration, —one bearing upon seeing, or training the mind through the eye; the other upon execution, or training the still physically imperfect hand to *obey* the mind. The patterns are only instruments to create occasions for these two forms of work. Many subjects, apparently simple, depend for their success upon perfect accuracy, and, wanting it, must do harm, by keeping before the mind false representations; while others, seemingly complicated, admit of so great variety as to bear imperfection without impairing mental vision. Objects of nature are more elastic in this respect than many others, and have the additional merit of being more observed by children. The animal and vegetable forms, and the other examples on the same principle, are thought to be sufficiently simple in their outlines, with the help that accompanies them, for developing children at this period.

Teachers who superintend, and other school directors, are earnestly requested to see to it that more is done than idle copying of the pictures. The whole work of the Guide is not too much for the age and time for which it is arranged. With the hope that it may be as well received as the two series that have preceded it, the author submits it to the teacher.

# LETTER TO TEACHERS.

My dear Friends, —

In sending out this Third Manual, with the accompanying series of cards, the thought suggests itself, that many, if not all, to whom it will go, must have followed the course through the two that have preceded it, and become accustomed to the line of method and style of expression, — matters never easy to communicate, and especially difficult through a written book addressed to strangers: so that I am now able to feel that I am writing to those who know me, even though the most of us have not personally met.

The patterns of this new series will seem to have grown suddenly difficult; and the instinct that makes me realize your first feeling about them prompts a few words of further explanation than that given in the Introduction.

If any among you are still unable to discover in yourselves marked genius in drawing, and so despair of rendering much service to your classes in the acquisition of skill with *grasshoppers* and *horses*, *tables* and *ships*, I am most heartily in sympathy with you. It has seemed to me to constitute my peculiar fitness for my work with the author

of this series that I had no uncommon abilities, though I may perhaps credit myself with having a more than common interest and earnestness in following out any plan which promises to put children into possession of themselves in a direction affording so great pleasure and profit.

Being, therefore, a representative of the average teacher, and being constantly associated with children's classes, and with young ladies while in their first training for their work, I have taken care to select and reject subject-matter and appliances of method with reference to just such conditions as would obtain in many schoolrooms everywhere: so I have made myself sure that the work is not beyond the powers, nor foreign to the interests, of children, nor yet too great in its demands upon teachers.

The use of the Guide that I would recommend is, that every teacher should make a careful study of it, drawing herself the patterns according to the instructions, and elaborating the suggestions; thus taking the full scope of the work at its best, and seeing the bearing of each item: she can then easily refresh her memory of its details by consulting it as her class come to the points. But few of the lessons are fully written, for the reason that a more concise putting is more easily referred to, and each teacher's individuality will call out individual peculiarities in her class. Where object-lessons are suggested, reference is had to a need that I have met in my own schools: it is to be hoped that they will not be passed over. It is unfair to judge of the skill of a physician if his prescription is not *fully followed.*

As the work has progressed, added study and experience have suggested possible changes in the earlier series; and we shall at once commence at the beginning, and make a study of the whole with reference to revision. It is our purpose to have this book more fully illustrated, and to add examples of flat examples for exercises in dictation.

We may congratulate ourselves that the work of elementary drawing is now fairly inaugurated, and its greatest difficulties overcome; but there is a vast amount yet to accomplish, and need of earnest and persevering effort. In mutual sympathy with each other's part in this, we are fellow-laborers, and, I think, in some true sense friends. Recognizing my own share in this alliance, I desire ever to remain

Yours sincerely,

J. H. STICKNEY.

BOSTON, Oct. 8, 1872.

# PRELIMINARY LESSONS

## UPON THE EYE, AND THE POWER OF SEEING.

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1. When you say of any thing, "I see it," what part of yourself do you mean by the word "I"? When you hear a *sound*, and say so, what part is the "I"? But is the I sometimes an ear, sometimes an eye, perhaps sometimes a hand? *Does* the eye do all that is done in seeing? What is it, then? Yes: what we call the *mind*. But blind people have minds; yet they cannot see. The *mind uses* or sees with *the eye*.

2. We know where the *eyes* are in our bodies: can you tell me where the *mind* is? No: we de not know that it has any one place; it seems to be everywhere at once, — now with the hand, but at the same time with the eye, the ear, the flesh, and at any other place where it is needed. In seeing, it is with the eyes. We sometimes think it is in the *head*. Why is that? The brain is there; and whatever the mind is doing the brain is affected by: so we shall need to study the brain a moment to find out how it is that we see. It is affected in one way, or at one part, by

ice or fire in the hand, another by sugar or salt on the tongue, and another by light before the eye.

3. But, if the brain is in the head, how does it come to be affected by something done to the hand, tongue, or eye? By the *nerves.* Yes, parts very like itself, that reach out everywhere in the body. Tell me, now, all that we have named as helps to seeing.

The *eye,* the *nerves,* the *brain,* and the *mind.*

The mind gets it instantly from the brain, and the brain from the nerves: we hardly know *how,* yet it seems perfectly natural to us, because it has always been so. But, if any thing is seriously wrong about the *nerves,* it does not let the brain act rightly, and the mind does not know as it otherwise would.

4. The eye is a wonderful little instrument that we *can* study, and know a great deal about. What it most concerns us to know is, that when the nerve that helps us in seeing, — the *optic* nerve we call it, — when it comes to the eye, it spreads out into a thin coating that lines the back of the ball of the eye. This nerve-coating is called the *retina.*

5. The retina, by means of the pupil and iris, &c., gets something like a picture of what we look at: but, before it can get it, there must be something to see; and we will stop a moment, and think how it gets it, since the thing seen does not touch it. I will ask you some questions: If you were lying half-awake in a bedroom where there was a lamp or gas-light, and some one should suddenly put it out, would you be likely to know it? You might say, "It is dark: I can-

not see any thing." But you were not seeing any thing particular before; only the light, which you did not notice much, but missed when it was gone.

Again: if you were sitting in some partly lighted room, so that the light fell on you, but not upon the other people in the room, could you see them plainly? Could they, sitting in the dark, see you? Why?

Or, suppose you see a blue dress some afternoon, and meet the lady who wore it again in the evening: would the dress look as beautiful? No. Perhaps some of you never observed: but it would seem to be green, if it were dark blue; or lavender, if it were light. The color of many things is different in different light.

6. So it is necessary to have *light* in order to see any thing; and not only do things look differently in different lights, but what we see is always something that belongs to the light: so that when the light is gone, it is gone so far as our eyes are concerned. But that you cannot understand till you are older.

What I would like to have you remember is, that *light* is necessary; that it must fall upon the things we see, and from them come back to us, then pass through the pupil of the eye to the retina, where the picture is made.

There are very wonderful things about seeing. I will tell you a little more about the *retina*. If you could look at it, you would see that a picture is made there in an instant of what is before your eye at any time: so that, instead of having the thing outside us, something like a

photograph of it is made by this retina; only the photograph is like the image in a mirror, and instantly, when we turn away, it is gone.

This makes it the same to us as if the retina and nerves could reach out to the thing we want to see. Look at this bell, many feet away from you, and think how it is that you see it. Because we have done it always, we do not realize how wonderful it is.

7. But, if it is a *picture* that our minds know about, it is not a real thing, is it? We know it takes a real thing to make it; for we could touch the thing, and see all its sides, by altering our position, if we liked; or we could walk toward it till it touched our bodies. So, if the real thing is there, it does not matter whether we say we see *it*, or a picture our eyes make of it for us. It is more natural to say we see it; for we do, as we see ourselves in a looking-glass. Our minds got used to finding *things* to answer to the eye-pictures when we were little babies, and first beginning to see; and we cannot remember that it ever seemed strange.

### ON THE RELATION OF SEEING AND KNOWING.

In the lessons upon the eye, we found that the eye made a picture, and the mind knew that a real thing made it; and so the mind passed over the fact that it was a picture at all, and thought of it as if it were the real thing.

The mind puts what it knows of the thing in various ways (such as touching it with the hand) with what it gets in the picture; and we speak of the two kinds of knowl-

edge as what *the eye* sees, or what appears to the eye, and what the *mind* sees. Question upon this with examples.

If you will take Card No. 2, and look at the country-house, you will see what I mean. Passing your hand over it will show you that it is flat; yet it shows two sides of the house and barn that really meet in a square corner, and make a right angle. But they cannot make a right angle on a flat card or any picture; and they do not in the eye-picture. That side of the house shows two windows: now, in the *real* house, all of that side is directly behind the front left-hand corner; whereas in the picture it is represented at the left, and the window farthest back is farthest to the left. I think, too, the barn is directly behind the house, so that, if the boy who sits there should move out in front of the house, he would not be able to see it at all: yet it is drawn still farther than the windows toward the left; and, because the picture looks natural to us, we know it is correctly drawn. How, then, is it? I will tell you. The picture on the card is like the picture the real house and barn would make to us; or, as I said before, it is drawn as the *eye* would see it in such a place as the one who drew it selected, and the mind has no trouble with either.

There is also another thing to notice. Of course, the house is as high at the *back* as it is at the front, — all such houses are: but, if we look at the left-hand side in the picture, the front-corner, reaching from the ground to the beginning of the roof, is a longer line than that of the

back-corner; and so, in another way, it is different to the eye from what we know it is, and yet, for the same reason as I gave before, is not wrong. We observe the same thing in the length of the corner-lines of the barn: and we say it appears so because the back-corners are farther away; and things appear — i.e., look to the eyes — smaller and smaller as they get farther away from us. By and by they would be a mere speck or point, and then, far in the distance, vanish altogether, as the height of the house and barn would at the place still farther at the left in the picture, and marked A.

## PERSPECTIVE.

THE study of things as they *appear* is called "perspective;" which means, "to see through."

It is as if you stood at a window, and looked out through a pane of glass, and traced with a pencil the outlines of what could be seen, letting the sash around the glass be the frame for your picture. Some of the lines would lie in different direction from what you would naturally think, as those of the side of the house in Lesson 3 did; but, after a while, you would discover a law, or rule, about it, the same thing being true in all similar cases. These truths are called "the laws of perspective." It is not needful that you should be told them yet.

I often study the outlines of things in this way myself, when I am sitting at a window, with this difference, that, instead of drawing, I only *observe*, the lines, and *think* of

their real and their apparent position. It has taught me more than I have learned in any other way, and will teach you, if you will try it. After doing this occasionally, you will be able to give up the glass, and observe in the room or in the street the apparent or perspective lines of things as they would be drawn in a picture, as they really are on the *retina of the eye*, or as they would be on an imagined glass. This imaginary glass or surface facing you in vertical position, and between you and what you see, on which you can imagine the picture to be, is called "the picture-plane" in drawing.

I do not think the children will all understand this subject, even if made, as of course you would make it, much more simple through freer and more elaborated language, and abundant illustration, than I could make it in a written lesson. But something of it will be received; and if the instruction is given pleasantly, and without pressure or demonstration, a door will be opened toward the truth; and subsequent lessons will keep it open. Besides, I know from observation, that many *teachers* think about matters like these, as things too difficult even for themselves to fully to apprehend; and I am sure *they* will get clear knowledge, so far as *this* teaching goes, if they follow it with care; and I want to add, that the knowledge of the subject which is needful for every one, is all as easily acquired when the steps are clearly marked. The difficulty has been, that teachers have explained, and students have sought to acquire, the full demonstration of the principle at

one lesson; which is manifestly impossible, where no special preparation has been made. I also think that a child of ten is as good a subject for the reception of the simple idea as a grown person, provided it is taught step by step, accompanied with a variety of examples, and kept in the mind by occasional exercise upon it.

## FORESHORTENING.

The next step in the training is the principle of foreshortening. Let it be taught as if it stood complete in itself, and leave the difficulties of its *application* to come as they are needed. It is the failure to divide the subject of perspective drawing into definite steps, that has made it less clear than the science of arithmetic, that closely resembles it. The lesson on the basket and the circle, fully elaborated in Guide No. 2, has introduced this teaching. If it is not perfectly fresh in the mind, let it be repeated. In the event of a change of teachers, it will, in any case, be necessary.

The points of value are, *that objects have a real and an apparent form*, the apparent being the one our eyes see, the real that which we have come to know by experience; *that the circle, as an illustration of this, may be so held as to appear sometimes in its perfect form, sometimes as an ellipse, and sometimes as a line* coincident with the apparent diameter. The change is effected either in the position of the object, we, the observers, being stationary, or a change in our position, the object itself being fixed.

It is customary to consider the eye as in fixed position, and to speak of the relation of objects to it. The principal changes are these: *The circle may be, with respect to elevation, at the level of the eye, or above, or below it. Its plane may be vertical, horizontal, or inclined. If vertical, it may face the observer, or be perpendicular to that plane, or inclined; if horizontal,* as has been said, *it may vary in elevation; if inclined, in degree of inclination.* All these changes have their corresponding changes in apparent form; but the variation is always from the perfect circular form, through ellipses wider and narrower in their shortened diameters, to the single straight line. See Guide No. 2, pp. 20–28.

All these can be proved by adult or child with any circular disk held in the hand, — one of stiff pasteboard will answer the purpose. The rings spoken of in the No. 2 Guide are better, because, if it is necessary, the pupil can hold them so as to look *through* them to an opposite wall, and see the varying shape of the part of it they enclose: when clearly received, any circular rim in the most familiar objects will recall the idea. Do not pass beyond this point till you have done what you can to make it clear: a little apparent loss of time will be more than balanced by rapidity afterward.

### THE SAME TEACHING APPLIED TO A SQUARE.

The circle having been brought freshly to mind, let some square object (e.g., cover of a school atlas) be presented,

and the steps of the teaching taken again in the same order.

1. In cases where the circle appeared in perfect form, we shall have with the square *its* real form.

2. With the square held in horizontal plane we may get the *single line* representing the thickness of the pasteboard, if *at* the level of the eye; a form wider and wider, as it is raised above or lowered below this height.

3. With the plane of the square surface vertical, but *perpendicular* to the observer, we have the *line* when it is directly opposite the eye, and a gradual increase of width as we move the object toward the right or left.

4. The plane of the object being made to incline to the observer, i.e., lie between the horizontal and the vertical direction, the same variety of effects may be produced. An open fan held between one and the light may be experimented upon in this way, or a swivelled window-blind.

The cube represents at the same time in its three visible sides three different aspects of this truth, and, by change of position, every variation in appearance possible to the square surface. It is a good object to study after the surfaces have been considered separately.

Call attention to the fact, that, in none of these cases has the square or circle had any of its dimensions increased: the change has always been between the actual form and one with some one dimension shortened. Tell them that this change, occasioned by change of position in relation to the eye, is called *foreshortening*. Let them look at the

cubes in Lesson One, the boxes, &c., in Lesson Two, and the depth of the houses in Lessons Three and Four, compared with the width across the front, as examples of this truth, and become familiar with the term that expresses it.

### PERSPECTIVE MEASUREMENT.

Next following comes the measurement of the *amount* of foreshortening as an indispensable adjunct to the fact itself. It is as necessary as the use of the inch or foot, the half, fourth, or eighth of a selected standard, or any practical comparison of actual dimensions.

This measurement is made by each observer for himself, from the place which he may happen to choose for his observation, without regard to distance from the thing measured: his instrument is a pencil or stick held in the hand. The method is simple, and the principle easy to recognize; yet practice is necessary to insure exactness in taking and keeping the measures. Children can do this quite as well as adults; and the practice upon it pleases them, and helps them to see correctly the perspective dimensions needful for representation of objects.

For first exercises, it is not well to associate the idea with foreshortening, or even with drawing. It is *one way to measure*, and may be so taught at any time.

The method to be observed in a school may be to let different pupils stand, in turn, in some place the teacher may designate, and take the dimensions of some surface in the room, as, for example, the blackboard, a door or win-

dow, a house opposite, the clock, a picture, &c. They do this by holding the measuring-stick first vertically, then horizontally, so as to measure the length of the part of the pencil in the two cases that they look across while seeing the object: this they mark, if there is no scale on the measure, by holding the thumb-nail upon the place till they can mark the length on the slate. It is well, for the sake of convenience in using the hand, to hold the pencil with the four fingers (two of them falling under, and two over it), so as to leave the thumb free for *keeping* the measure.

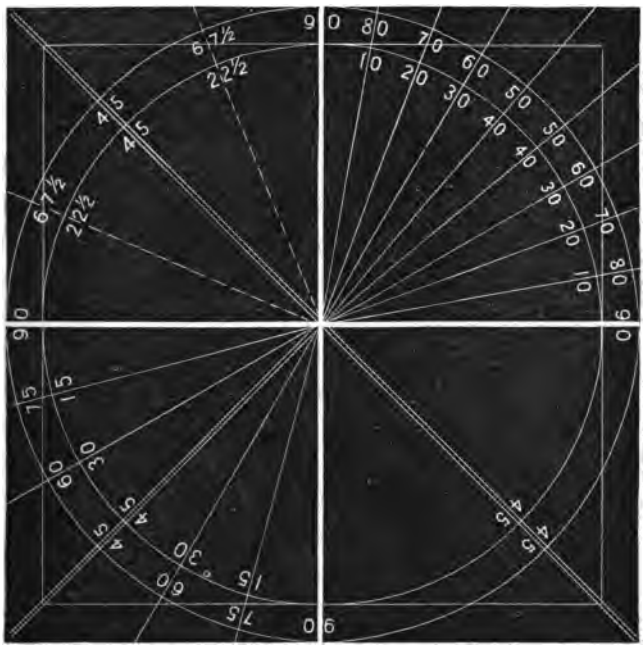
The measure must always be held in a *vertical plane*, i.e., it must face the observer, and not be allowed to tip backward from, or forward toward him; and the distance from his eye must be uniform. The least variable distance is the hand at arm's length; and this is the one usually selected, though it is not always necessary. A string fastened around the pencil, and held at the other end by the teeth and a knot, will insure accuracy at less distance, which is sometimes desirable.

The numerical relations that accompany all use of measures must be applied as the pupil becomes expert in using them, otherwise he can show, but cannot *tell*, his results. The expressions "half as long or wide, half as long again, or a third longer, twice or more times," &c., are familiar and practical.

Exercises upon measurements may occupy a few minutes, now and then, which would otherwise run to waste; and the

saving of them in this way will greatly facilitate subsequent drawing. Nothing is more common in schools of advanced pupils than mistakes growlng out of carelessness in this simple exercise.

## MEASUREMENT OF ANGLES.




An angle is made by two lines having different direction. If prolonged, these lines would meet somewhere, in which case the angle is fully represented. The place where the lines meet is called the apex, or vertex, of the angle.

The lines diverge from the apex, or converge toward it; and this divergence or convergence may be slight or great, making the angle large or small.

The *size* of angles is measured upon the arc of a circle, of which the apex of the angle is the centre, and the lines making it radii. It does not matter how large or how small the circle may be, since the arc between the two lines is compared with the circumference of the circle of which it is a part; and it would be the same sized part of every circle that had that point for its centre.

For convenience in measurement, each circle is supposed to be divided at its circumference into 360 equal parts, and each part called a degree (marked thus [°] Ex. 60°). And an angle is large or small according to the number of degrees it makes in a circle, and not by the length of its lines.

If a circle were divided by cross-diameters into four equal parts, each would contain 90°; and the angles made by the dividing-lines at the centre would be called "angles of 90°."

Such angles are very common in the lines made by the edges of objects; and we call them *right angles*. Every square corner is the apex of such an angle.

The right angle is used as a measure for all others;

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NOTE. — All these points are to be represented upon the board, and illustrated in objects. The last point will be entirely new, and should be illustrated by carefully-drawn concentric circles described about the apex of the angle to be measured.

those having a less number of degrees, i.e. those that are smaller, being called *acute* or sharp angles; and those having more than 90°, *obtuse* or blunt angles.

Right angles are, of necessity, always of the same size. Acute angles may vary between 1° and 90°, and obtuse angles between 90° and 180°.

It is important that we should learn to recognize the right angle in any position as soon as we see it, and to measure the size of any acute or obtuse angle in degrees.

### WAYS OF DOING THIS.

1. Extend one of the lines of the angle beyond the apex, and draw a small semicircle: the line that is extended makes a diameter of the circle, and encloses 180°; and we can more easily judge whether the angle is a half, third, or fourth of that, than of a whole circle.

2. Draw a line to the apex of the angle to be measured, so as to make a right angle with one of its lines. If the angle is acute, it will make a part of the right angle, or of 90°; and, if it is obtuse, it will be more than the right angle: so that the right angle will be a part of it, and so much more than 90°.

3. A surer way is to make a pasteboard card, with angles of different sizes drawn upon it around a centre, like the diagram, for every child to use for a reference or measure.

It is more often required to measure the inclination of a line with reference to either a horizontal or vertical direc-

tion. In this case, the card may be laid so that one of its sides represents that horizontal or vertical direction, and so that, at the same time, some *other line* going to the centre will be a continuation of the line we are studying; then the angle made by that line with one of the horizontal or vertical lines of the card will measure the degree of inclination of the line. It is vastly easier to use, and to *show* how to use, than to tell. It will at least be of service to the teacher in criticising the work of the class. A large one drawn upon the board, and referred to occasionally, will help the children to judge approximately of the inclination of lines and the comparative size of angles.

This exercise should be repeated in different forms frequently throughout the course.

## STUDIES UPON THE CARDS.

### *The Cubes.*

It will be difficult for the teacher to discern whether or not her pupils see in the drawings in Lesson 1 *real* cubes, or solid blocks; their work being to represent them upon a flat surface with lines answering to lines upon the flat surface of the card. There is every thing to encourage misconception if it is once in the mind to allow it; and it is not that they think they are *not cubes,* but that they fail to keep the thought that they are. To appreciate the difficulty is to see how to meet it, so far as it can be met by the teacher. One way to do so after at-

tention is first called to it is always to use the terms "edge," "corner," "top," "sides" and "base," instead of "line" and angle, and to make free use of objects of cubical form while studying the card patterns.

A very necessary thing for the teacher to do in this connection is to make the children understand the relation of the block, in each example, to the eye of the observer. A single lesson will do this, which may be pursued in this way: —

1. Take some box, — a crayon-box will do, — and let a child hold it near his eyes so as only to see one side; then gradually to move it away in horizontal direction so as not to change its elevation. Other children may then hold their books, with one cover to represent the side of a box, in the same way; after which all may draw the shape they saw.

2. Replace the box; then move it gradually downward so that the top begins to be in sight. Apply the idea of perspective measurement, which has been given separately, so far as to lead the children to see that the top, though wholly seen, does not show its actual width till it is lowered very far below the eye. Then call attention to the foreshortening of the top of the cubes in all the examples of the card, and let the children generalize the idea by saying that these cubes are seen with their tops in horizontal position, and below the eye; and that the width or depth of the top appears to be foreshortened. See p. 18.

3. They will hardly need to be reminded that the different examples in the upper line are but different views of

the same cube, and that the corresponding ones below only show how the cubes would appear if they were so transparent as to show all their edges.

4. The box must be held in position to represent Ex. 1, then moved slowly to the right till the same is true of the left side as was discovered in regard to the top.

5. Ex. 3, 6, represent the cube turned so as to be nearly cornerwise. If it were exactly so (and it may be well to try a cube, if the teacher has a perfect cube that is large enough), both sides being inclined equally, the foreshortening would be the same, and the drawing of the two alike, except that they would be reversed.

6. Question the pupils upon the real and represented cubes, to call attention to their parallel sides. The lower line of cubes show these in the card examples. Any practical question — such as the reason why the back of the cubes is represented smaller than the front, or why the bottom is made wider than the top —may be asked by the teacher; and, if they cannot tell after the teaching that has been done, the books and boxes may be resorted to till the children can see that their eyes tell the same story as the cards, when vertical and horizontal measurement is applied. If the idea of perspective measurement troubles them, let this use of it go till they have been exercised more upon it with larger dimensions in and about the schoolroom.

All this teaching should precede the drawing: when it has been given, the order to be pursued in drawing the lines should be given and fixed in the minds of the class;

after which they may work by themselves upon the examples on the card.

After the studies upon houses, as represented in the lessons upon Card 2, the children may be shown, that what is true about the vanishing-point to which the horizontal lines that recede from the observer appear to converge, is also true for such lines as the edges of the cubes make; and by placing the card upon the desk, and continuing these lines by means of edges of other cards, they can find the point, its distance from and relation to the drawing, so as to make it serviceable.

As a general rule in drawing, begin with the parts nearest the observer.

I would recommend a study of the cubes every week or fortnight, so as to fix the principles definitely: their extended application will warrant the teacher in giving a great deal of study to them.

The boxes, book, table, and cricket in Lesson 2, are examples of the same idea, and may be made to vary the exercise, and give interest. The most careful measurement of lines and angles will be needed; and the training of the eye may be carried to any degree of excellence the teacher may feel disposed. The aim of the author is the training of the child, by means of perspective and actual measurement, to give the key to the representation of such objects as a child may wish to draw, quite apart from cards or patterns. Any thing which inspires the child to feel desire and confidence to work independently will be in the line

of successful endeavor, and will tell upon the desired result.

It may be well to say here, once for all, that the lessons may be taken in any order, and that each will need to be taken many times before the course is finished.

### THE HOUSES.

In patterns so involved as these, each separate part should be studied and drawn by itself; viz., chimney, door, window, fence, steps, and trees, and each line of each considered with reference to its position, direction, and length.

Copying the picture line by line should not be attempted, for it will surely fail; but the lines in different parts of the picture that represent features that are alike or similar should be compared; and if they differ, from any cause, in the different positions, a reason for the difference should be sought. This having been done before the pupil begins to draw, he will simply need to be told to make the parts of his drawing harmonious with *each other*.

In the country-house, all the lines that represent the left side, which, in reality, are level or horizontal, appear in inclined position, or as slightly oblique: this is because they are receding, or going back, from the observer, as has been explained in the Introductory Lessons. Being inclined, they would meet somewhere. In this picture, it would be at the point A.

We have said (see Preliminary Lessons, p. 16) that, if removed far enough away, a man or house would appear as

a mere speck or point. In this picture, the point marked A represents the place where this would be true in regard to the house and barn. We call the point the "vanishing point."

By actual measurement from the real house, A would be very far away, — many miles, perhaps, — *a point in the distant horizon.*

The observer, by moving to the right or left, would change his view and the apparent place of this point. This you all know.

This makes it of less consequence that the place of A should be exactly marked than that the receding lines should tend *directly* toward it. It might be well to let the pupils work upon the lesson without much help at first, and afterward allow the use of a card for a ruler.

Many of the children will be slow to observe that even such minute lines as those of the top and bottom of the side windows, the clapboards, and shingles, or any others, when used to represent receding edges or lines, follow the law as certainly as the longer and more marked lines of the outline of sills and roof. If the teacher will choose for her drawing a part of the board near the end, so as to have a place for a nail, she may use it for fastening a string to represent the various lines converging toward the point A, and, by moving it, may draw her lines so as to explain to all her class at once from her own drawing. Or she may do the same thing by letting each child take a card, and hold its edge firmly with the thumb-nail upon point A in this

picture, and then, with this point for a pivot, move it around so as to coincide, in turn, with each converging line.

In the village house the point would be outside the picture a little. Let the pupils find the place by moving the pencil in the direction of it along two or more of the lines. It can always be found in any correct drawing of houses or blocks, and, when found, will correct any mistakes in the direction of lines.

The two pictures given upon the cards are types of the varieties that children will be interested to draw. Village or country children should be required, after drawing the card-patterns, to bring drawings of the houses in which they live, or small shops in the vicinity; and children in cities, to make drawings of blocks of houses.

Questions like the following may be asked of each child as he exhibits his work: —

Where did you stand with respect to the house?
In which direction was it from you?
Where was the vanishing-point?
How many sides of the house did you see?
Which was in front view?
What was the direction of the other side?
What angle did it make with the front?
Was any part of the house below your eye?
Was any part above?
Where, in this respect, was the vanishing-point?

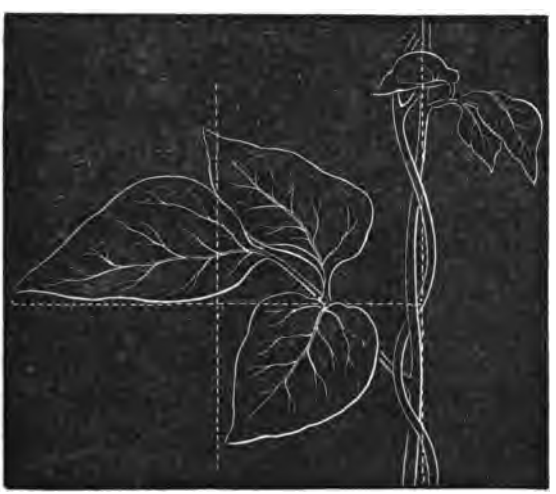
If the lines that recede were below the eye, in which way would they appear to incline?

If above, in which way?

In which way those of the roof?

Why?

It may be well to draw imaginary houses, the teacher telling the class where to place the vanishing-point, and where and how to draw the two vertical sides of the front, then letting them exercise judgment in completing the picture.



SKETCH OF LESSONS ON THE LEAF OF BINDWEED.

*Introductory Conversation.*

Do you *know* the plant? What is it like?

Does it seem to grow on a bush, or tree?

What kind of a stem has it?

Does it trail, stand erect, climb, or twine?

Examples suggested to them of all these ways.

It climbs like the bean, but not so high; and its leaf is unlike that of the bean. Show a bean-leaf, or draw its outline.

How would you describe this leaf?

*It is pointed.* Yes; but so is a leaf of grass, or the lily-of-the-valley.

*It is broad.* Where is it broad?

*Near its base.* Most leaves are broadest near the middle; but this is peculiar in being broadest near the base, and very sharply pointed. It is sometimes called an arrow-headed leaf.

Look at the *edge* of the Virginia creeper opposite; then tell about these leaves of bindweed.

*They are entire;* i.e., they have no teeth, or notches.

Describe the veins.

*The middle one, or midrib, is nearly straight: the others go out from it like branches.*

Where are the branches longest? Look at every branch in every leaf.

In this leaf I have drawn (an elm-leaf), notice that two veins go out from the same place on the midrib on opposite sides. Look now at the bindweed, and tell how its veins branch.

*One at a time, and first on one side, then on the other.*

We will say they alternate; which means, "first one, and then another."

Tell me another difference between the *veins* of the bindweed and those of the elm.

Those of the bindweed have little branches.

Count the leaves. *They are in clusters of three each.* That is the way they grow, — two opposite each other from the side of the stem, and one between them at the end.

Now we will study *the stems* to learn how to draw them.

There are two. Find the one that is nearly straight. How many lines represent it? What is their direction? Lay a card over this one so as almost to touch these stems at their right; and make its edge exactly vertical: then see where this stem bends most from the vertical, and which way.

What relation do the two lines of each stem bear to each other? *They are parallel.*

*The Drawing.*

Draw now upon your slates the straight stem.

What is the general direction of the other stem? Vertical. Is it straight? No: *wavy.*

How many times does it cross the straight stem? What do you observe about its *way* of crossing? *It goes over and under, or before and behind.* What word tells that any thing is first on one side, then on the other? *Alternate.*

Lay down a card as before, and study the wavy lines. Draw from the top of the straight stem a double curve crossing the straight stem as in the example, and now a

line parallel with it to represent the size of the stem. Notice that one line is heavy, and the other light. What do you suppose is the reason for that? The side toward the light is a faint line, the one in shade a heavy one. Make both stems correspond in this respect.

Finish this stem by drawing the lower curve. Erase all the work, and do it again and again till it is easy for you.

### *The Leaves.*

Find the *apex* of the middle leaf in the large cluster; then move the pencil along in a horizontal line till it comes to the stems, and let it rest there till you notice at just what part of the stem it is, and mark the place upon the stems of your own drawing.

The *distance* between this point and the *end of the leaf* at the left is the same as that between the bottom of the stems and the place where the small cluster of leaves grows. Place the point; then measure with your pencil to see if you are right as to distance.

Now place a point half-way between these two. Let your pencil point to this place on the card; then see what is directly over it. The point of the upper leaf.

How far above? The apex of the leaf is a little to the left. Place a point where you think it is.

Look, now, to see what is *below* this middle point. The apex of the lower leaf is as far to the right as the upper was to the left, and not quite so far away. Place a point

for it. See where all these points are; then erase them, and draw them again, so as to learn to do it quickly.

Find upon the card the place where the two opposite leaves branch. It is half-way between the middle point and the stems. Mark it; then draw the midribs of the three leaves, and now their veins, remembering where they are to be longest. And now draw the outlines of all the leaves, and the parallel lines of their stems.

After drawing so much till it can be done readily, add, without guide-lines, the small cluster at the top.

### THE FRUIT.

The currants are circular in outline, the cherries and gooseberries slightly lengthened into ovals. It is better to draw each one fully, and afterward erase such parts as are out of sight. Let special attention be paid to the *strength* of lines at different parts.

### THE FLOWERS.

The crocus and lily-of-the-valley may be taken line by line, the class following upon their slates the work of the teacher upon the board. After a plan is given they may perfect their work by repetitions at their leisure from the cards. Exact measurement is of less importance at first than correspondence in parts.

The edges of the petals of the pink are examples of curved angles joined together in groups. The teacher will do well to enlarge these points, so that the direction of the

lines can be fixed in the mind. Each petal should be drawn by itself, after an oval guide-line has been drawn to represent the general form, and a place marked within it for the centre of the flower.

### INSECTS AND SHELLS.

The examples in Lessons 8 and 9 represent animals very superficially known in their structure and habits by children of this age.

This is not the place to mark out courses of teaching in Natural History; but nature points to this period as the one for such knowledge of animal life as will create an interest in scientific study afterward in those who have time to pursue it, and stand in the stead of such study for those who must drop out of school courses early.

Four varieties of insects are represented. It will be easy for the teacher to copy upon the blackboard, from illustrated books, pictures of any species she may wish to have studied and drawn. "Insect World" and "Ocean World" are the titles of two very delightful and valuable works by Louis Figuier for general reading for the teacher. They are full of anecdotes and pictorial illustration of the structure and mode of life of these and other classes of the animal kingdom.

#### *Insects.*

Insects are, for the most part, active little creatures, far outstripping the birds in flight, or jumping many times their length, doing work that for delicacy cannot be excelled, and

exhibiting qualities that children would do well to imitate. Examples of these powers, if of no others, should be given at this time.

The body of an insect has three parts, usually quite distinct, sometimes nearly separate. The head contains the eyes, which are composed of a great many single eyes united in one, which (as they cannot turn them, nor even move their heads, apart from the whole body, so that each little eye can look but one way) seems to be a necessary provision for their active life. The head also contains the mouth and antennæ or feelers: these latter parts are nearly straight in the butterfly and grasshopper, with a knob at the end. The moths, which are often very like the butterflies, are distinguished by having swollen parts in the middle of these antennæ instead of these knobs. In the beetle they are jointed, and often furnished with points, and with bristly hairs.

The second division of an insect is the chest: the wings and legs proceed from it. Of wings there are either one or two pairs, if there are any: a few species seem to have none. A true insect has six legs, though sometimes only four are of use. These have many joints, and allow great freedom of motion.

The remaining part of the body contains the stomach and other organs. In most insects that sting, the sting is at the back of the body instead of in the mouth, as the children generally suppose.

Besides these three parts, the whole body is composed of

wings, which are to the insect what bones like our ribs are to us. These are plainly shown on the back of the bee, or the underside of the grasshopper, in the drawing.

The beetle has two pairs of wings, like the bee and butterfly; but the upper ones are hard wing cases, making a covering for the delicate ones underneath them, which are the ones used in flight. Many beetles are found in very dirty places, so that these cases, and the hard surface of the body underneath, are needful for protection. The lady-bird, one of this beetle family, is very easy to draw, and very interesting to study.

In drawing, begin with the body, then add the wings, legs, antennæ, and afterward the finer lines representing the character of their structure.

Let care be taken that opposite parts are made symmetrical in the drawing. The grasshopper is the most difficult, and may be left until later. The wings give practice in delicate lines, and the points, joints, and hairs in minute ones. In the first drawings, omit all details, only allowing them to be added when the outline is generally correct.

### *Shells.*

There is much that the children will like to know about shells, and the little animals that have bequeathed them to us. It is so common to see the shells without the living forms that produce them, that children often fail to get the true idea of their relations.

The soft, fleshy mass has very little to excite childish ad-

miration; some species, however, may be studied with but little trouble in their living state. The forms of the shell are the chief interests. The bivalve is a common variety; and, after studying it, the class may represent that of the clam or oyster from the objects themselves.

The univalve shells are more difficult. The card presents a variety in size. After the study of the picture as standing for a shell, till the pupils get the idea of its solid character, the drawing, particularly of the *larger one*, may be taken as a collection of curved lines. After making points for the vertical and horizontal dimensions, by drawing a line to answer to the direction and distance between the base and the apex, and a horizontal across it in the middle to make the highest point of the mouth, make a rectangle to enclose the mouth, and a triangle for the whorls meeting at the apex; then mark on the upper half of the vertical line the places where the whorls severally cross it, and see how far each is a perfect curve, and where it bends from it to indicate the spiral direction.

The smaller shells are to be treated in the same way.

## FISHES.

Let the first lesson be upon the head of the trout or bass, that of the pickerel at the left being more difficult; and let the mouth, eyes, gills, and pectoral fins be drawn line by line, as in the example upon the card.

Next let a guide-line be drawn in horizontal position to

represent the whole length of the fish. One-sixth of the line marks the relative proportion of the head in the trout; and one-sixth of the opposite end, that of the tail. In the bass the tail is one-fifth of the whole length; and a vertical line, drawn just behind the gills, cuts off one-fourth. It may be well, in drawing, to complete the drawing of the head and tail before considering the outlines of the body.

The curve of the body above and below is to be measured with reference to the length of the horizontal line and the place upon it where the curve has its greatest altitude. After the upper line has been drawn, the lower one may be measured by comparison with it.

The dorsal or back fin should be added next; then the anal and the ventral. Let the children themselves decide of which of the fins there would need to be two, and to what parts of birds or beasts they severally answer.

The placing of the fins needs special comment. The children may be told, if there are no pictures at hand, that the place of the fins is one way of distinguishing different varieties: thus, in the codfish and in the perch family, of which the bass is one, the ventral fins are directly below the pectoral; while in the trout, pickerel, and herring, they are farther back upon the body.

The other points of interest in the study of fishes are the *cold blood;* the *scaly* or *smooth covering;* the very *regular outline,* involving entire absence of distinctly-marked neck and shoulders; the *relation* of *fins to movement,* each kind being necessary, and the strength and position of each

being adapted to the kind of motion and the resistance to it; the *gills*, and *method* of *breathing*; the *teeth*, and their setting; and the adaptation of all these to the life of the fish. Any text-book on natural history will sufficiently elaborate these points, so far as a book may; but nothing will take the place of the *knowledge* to be gained by a little observation of two or three varieties: a gold-fish kept for a little time in the schoolroom will teach more than can be taught without it by any method.

### THE ROOSTER, HEN, AND CHICKENS.

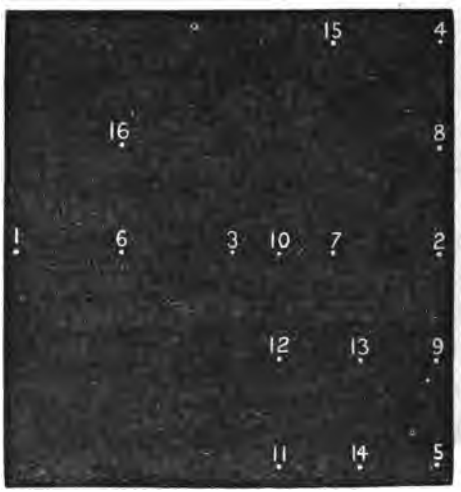
The members of the family represented in Lesson 11 must be drawn many times singly before they are attempted as a group.

#### *The Rooster.*

Beginning with the rooster, let the children place the points as indicated in the first diagram. The numbers should be associated with their respective points, so that, after going over the work with them a few times, the teacher may simply count for the children as they place them. For example: In the first dictation she tells them to place two points in horizontal line, and two inches at the least apart. Calling the one at the left "*one*," and the other "*two*," she places a third in the middle between, and gives its number. The fourth is above the second, and as far from it as is the third; the fifth at the same distance below. It will be easy to define the place of each of the others from

the diagram; and, if it is a task to remember the order, the figures may be made instead of the points while they are learning it: afterward the children should place them rapidly at the count of the teacher, otherwise time is wasted in getting the guides at each time the lesson is repeated.

The second diagram indicates the use of these points. It should be put upon the black-board by the teacher or some




child, so that the class may study the outline with direct reference to the points.

Stress should be laid upon the statement of these in language as a help to the memory, not to the extent of committing every one to memory; but, in a natural statement, each that enters into the outline should be spoken of in its

association with it. For example: In the vertical line of points, "4 is for the height of the head;" "8 is at the right of the lowest point of the wattles;" "2 marks the fullest point in the breast." Those that are placed simply to assist in locating others are of no consequence afterward, and may be erased.

It will be easy for the teacher to correct the drawings by means of these points; after which they may be erased, or they may be finally made so small as not to disfigure the drawing.

The filling-up of the picture must be taken by each child from the copy upon his own card.

*The Hen.*

The diagram of the hen will tell its own story. If the teacher will trust herself to draw with the children, the outline having been previously drawn upon the board, and by them upon their slates, the relation of the parts of the outline to the squares will be easily fixed in the memory.

Other cards laid across the picture in the line of any of

these guide-lines will be useful to the children, inasmuch as they cover parts not at that moment needed, and so make it easy to concentrate attention upon the relation of those in question.

When the whole card is undertaken, the teacher will do well to call attention to the comparative distance of each of the birds from the observer; and hence its height in the picture, so that in every possible way the children may be helped to see things in their true perspective.

It may be needful to remind the teacher, that, except when other cards are to be used to cover parts of any example, it is important that the cards should stand in the groove made for them in the frame of the slate, so as to make the angle of vision the best for the child.

### THE TURKEY AND GOOSE.

After getting the ovals correctly drawn, — which, being a matter of measurement, can be done with approximate accu-

racy, — the outlines of both the turkey and goose will be found to be very easy to reproduce. It is, therefore unnecessary to elaborate this part of the teaching.

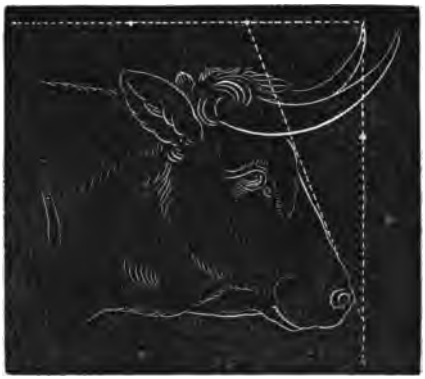
Materials for side-lessons upon the animals themselves can be easily supplied by such children as are familiar with poultry-yards. The hard, rough skin of the legs of the turkey; the close, smooth plumage of both these birds, as compared with that of the hen family; the shortness of the wings of all ground birds; the position of the legs of the swimming birds, and their webbed feet, and long, broad bills; the relative length and position of the neck in the different birds,—are all in the line of drawing; and a knowledge of the habits, disposition, and manner of life, will increase the interest, and otherwise develop the powers, of the children.

The accompanying diagram of the turkey will show the teacher how she may make one for the goose; or, if she likes better, she may let the children move the pencil round and round till they get the idea of the form, and so work without one.

### HEADS OF ANIMALS.

So much that is characteristic in animals is expressed in the head and face, that it is needful to make special study of animals in this way. It is not desirable to take them in order: the interest may be increased by introducing each by itself.

The facial line, and its relation to the upper line of the head and neck, is the point to be considered with the greatest of care. The card for the measurement of angles will be useful here: it will be well for pupils to measure each angle in degrees.



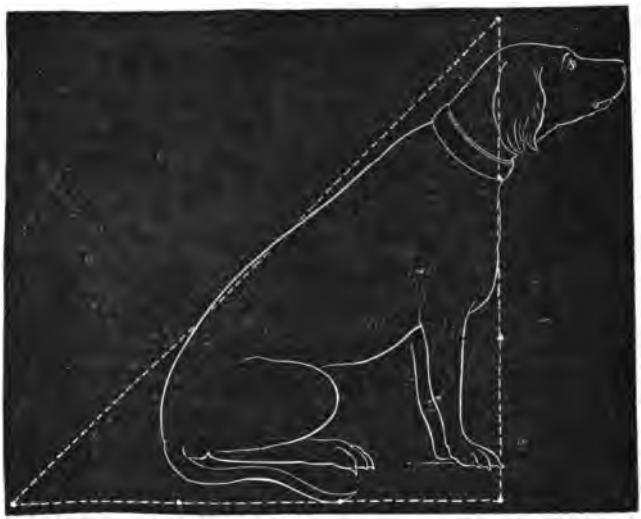
In the absence of practice of that kind, the accompanying diagram will suggest a use of the *right angle* made with a vertical and horizontal line.

THE DOG.

The diagram for the dog is, as will be seen, a right-angled triangle, two sides of which are divided into thirds.

After this variety of dog has been drawn so as to satisfy the pupils, the teacher can easily interest them in attempting other varieties, or this variety in a different attitude. There are a few simple perspective measurements which will help them in studying the living subject so as to give a general idea of its form; as, for example, the height of the body compared with the legs below the body, the length of the body compared with its vertical height, the carriage of the head, &c. It will be easy for the teacher to make

a collection of pictures sufficiently accurate to make drawings from; and she can, perhaps, give in no way greater



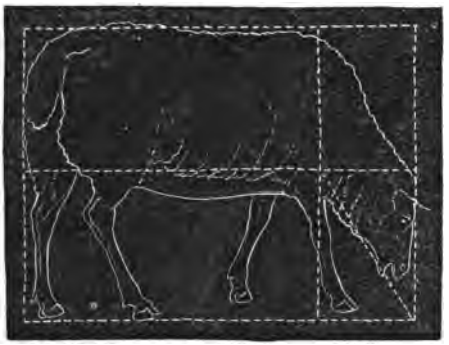
pleasure to her class than by reducing these pictures to some definite diagram form, so that they can reproduce them.

### THE SHEEP.

The diagram for the sheep embraces, first a square, then an addition of a little more than a fourth its length at the right. The body fills more than the upper half. In drawing, let the outline represent the soft woolly covering by being broken and slightly irregular. The hoofs should be studied

as a special lesson, and very much enlarged, so that the shape may be distinctly marked.

If the children attempt to draw the sheep with the head erect, the head in Lesson XIII. will give them the idea of



the elevation above the line of the back and the facial angle. In such a position the two fore-legs would be parted less, and the fulness of the breast would fall chiefly within the square.

### THE HORSE AND COW.

The diagrams of these animals being given upon the children's cards, it is intended that they shall study out the proportions for themselves, assisted by the questions of the teacher. The most of these are apparent at a glance; but it will not be out of place to state them for the convenience of the teacher.

*The Horse.* — A B C D is a square bisected by E F.

I is midway between A and E, and H is at the same distance from A. The outlines of the neck unite with those of the body at these points.

J is midway between I and H, and S A is of twice the length of A J.

As the horse naturally carries his head, the gullet is on a level with H, the highest point of the withers. S L makes an angle of eighty degrees with S A J: it makes a *right angle* with a straight line drawn from S to H. The length of S L is the same as that of S A.

The two lines drawn from S L at L and N are perpendicular to it. This completes the outline of the head.

The point K is midway between R and B: it marks the height of the knee. T and P mark fourths of the lower half of the square, and X the same distance below F. Z is midway between H and D. The other letters are less needful; but all of them will be a guide to the eye in drawing.

*The Cow.* — The line E F bisects the square A B C D. H K and I mark fourths of the lower half. L is half a fourth of the upper half, and marks at O (which is a fourth's distance) a point in the shoulder. P is as far at the left of A as E is below it. P R is equal to three-fourths of P A; and the angle made by them is fifty degrees, or a little more than half a *right* angle.

J, at the level of H, marks the point of the hock.

## THE HUMAN FIGURE.

Drawing "people" is always of interest to children if made elementary.

It is doubtful if any large proportion of them can ever learn to work delicately enough with eye, brain, and hand to catch and reproduce those distinctive features of a face or form which constitute what we call a personal likeness; but moderate abilities give pleasure, and children should not be deprived of the little they can have, because they cannot be artists. Furthermore the quota of future artists in all the various departments of caricature, illustration, portrait-painting, and ideal figure-drawing, demands at least an average of *one* from every schoolroom; and the teacher may not be able to recognize the unconscious subject who is being to some extent made or marred, developed or cramped, by the doings of every day in her schoolroom.

As teachers we cannot too often be brought face to face with this truth, the tendency to deal with and estimate children in masses being so easily fostered by our prevailing systems.

It is encouraging also to remember that early art was for a long time content with a rude, representative character, growing gradually up from it to the noble perfection we enjoy; and that each new generation rises through the same successive experience, only, through the help of prepared ways and instructed guides, it moves over the early steps with greater rapidity.

It is a matter of astonishment that children do make such rude figures for people, even after they draw many things quite well.

Let the first teaching be very elementary. The two faces in front view in Lesson 17, if considerably enlarged, will be as simple as any thing.

1. The oval which marks the outline of the face should be worked upon until it is remembered, and can be quickly reproduced. Five points placed at equal distances in vertical line, and a horizontal line of three-fourths the length drawn across between the middle point and the one next above it, are to be made the diameters of the ovals.

2. The five points mark definite places in the face; the upper fourth is the distance from the top of the head to the highest point of the forehead; the second from this point to the nose; and the fourth to the end of the chin. Let this be committed to memory.

3. The eyes may be added next; the three upper curves in each first, then the two lower, and the circles and white spot for the iris and pupil.

4. The nose and mouth are to be studied as made up of definite lines in particular relations to each other. A little practice, with the copy at hand to guide, will do more than any direction, till the teacher wishes to give ideas about varieties in mouths, which will not be at this stage of the work.

5. The hair need not be copied exactly. Generally speaking, locks of hair are represented by lines nearly parallel,

at least in a part of their course. The fineness of hair is suggested by the lines being much broken.

The heads in profile are based upon the same general proportions as the others. Call attention to the relative prominence of the forehead and chin, then to the relation of the line of the nose to a line between them. Let the children feel their own heads to ascertain at what part of the back of the head is the greatest fulness, and compare its position with the height of the top, and base of the ear.

### THE BOY AND GIRL.

The rustic figures of children will need few points of direction. For the little boy, let a vertical line mark the height or level of the different points. The upper point marks that of the crown of the hat, the middle the waist, just in the middle of the fringe of the lower end of the scarf, and midway between these two the end of the chin. The base of the vertical line is between and on a level with the toes of the boots and the opening of the skirt of the coat, half-way between this and the middle point.

The greatest width is across the skirt: it is nowhere more than half the vertical line, and is nearly equal on the two sides. After so many lessons, the children should study these out for the most part for themselves.

In the little girl, there are two parts above the waist to the three below.

There are other studies upon the human figure, that can

be easily given, and there are many pictures that can be studied and copied. Photographs are within the reach of every child, and woodcuts in every illustrated book or paper.

The teacher is most safe when using simple things, so far as the whole class is concerned. The hand, then the hand and arm, the ear, the eye, and the foot, are excellent studies. There is space here only for suggestions in one or two directions.

Let a well-formed pupil be selected to stand on a table before the class to be measured and studied. By means of the pencil in perspective measurement, let the class take his height, his width across the shoulders, and the place on the vertical height where the line of the top of shoulders crosses it; the teacher assisting and correcting. Next his width across the waist, the place where the elbows come when arms are hanging, also the tips of the fingers. The height of the head above the forehead compared with the forehead, and this upper half the face with the lower. The lower part is to be studied to estimate its roundness, or the shape of the oval at its pointed end. The arm hangs outward from shoulders to elbow, but bends inward between elbow and wrist. The fingers are of half the length of the whole hand; the middle one being straight, the fore finger curved slightly toward it on one side, and the third and fourth on the other.

The pencil held in vertical and horizontal position will determine what parts are in line with each other in these

directions, and how far others lie outside the lines. These and many other studies will help the children to observe. The rule of measurement is absolute and unvarying, and practice will improve them in *accuracy* of measurement. For the most part they had best draw from pictures, but it is well that they should see how it is possible to draw from living models.

The Cavé Method uses a thin muslin screen, which, being held firmly between the observer and the subject, is drawn upon with black crayon or charcoal, and this outline afterward transferred to paper.

### THE BOAT AND SHIP.

If there are boys in the school, there will be no need to create an interest in these subjects. Girls have less natural interest; but it is well for both boys and girls to think how wonderful the invention, and how great the perfection, of a vessel or steamer of the present day; and it is well, that, while they are working, the class and teacher should be kept in sympathy through conversation upon the subject of their work.

Carry the class back in imagination to the time when little, if any thing, of the kind could have been known. The idea of a perfect ship could not have been received, or, if it had, the ship could not have been built; for hundreds of trades or employments are represented in a ship ready for sea.

The idea must have existed first in a very rough form, — suggested, perhaps, by a floating log or fallen tree, a raft or flat boat on smooth water. Soon the need of a keel below the water would be felt, and finally sails, that the people might take advantage of the wind.

Even so late as this, the boat would be a clumsy affair. But observing people would study to improve it; and little by little new ways have been adopted, till now it is hard to admit the possibility of essential improvement. There are very interesting fanciful and mythological stories of the earliest attempts at navigation, which would be out of place here, but are within the reach, if not already in the knowledge, of every teacher.

The diversity of conditions growing out of the size and character of the different bodies of water, and the extent of communication between country and country, suggest the need of great variety in the kind of vessels, and lead to the consideration of the names of the different kinds of craft. Let the names of these, small and large, from the dory, canoe, and other open row-boats, to the yacht, brig, sloop, schooner, and fully-rigged ships, be given and defined.

The teaching which is suggested by this subject may be given systematically, or broken up into a thousand parts, and given by the way. It will be sufficient here to suggest that one of the best and most far-reaching lines of practical, oral teaching is opened that children at this age can have; gathering up incidents of travel, common voyages and their freights, geographical and historical facts, and classes of

people. If the teacher makes a beginning, her own practical knowledge will grow, and she will, in searching for facts for her children, find much that is of value to herself.

### THE DRAWING.

It will be better in both lessons to draw in the middle of the slates a figure of the size and shape of the black part of the card, and so make a transfer of the whole copy upon the card to the slate. Exact proportions are unnecessary; a general correspondence being sufficient for the purpose.

### THE BOAT.

1. *Draw the horizon line one-third of the height below the top of the picture. This divides the earth from the sky.*

*Items to be considered.* — Meaning of horizon or horizontal line?

Distance of the horizon from the observer?

Reason why the ships near it look so small?

Use of lighthouse?

Reasons for having one here?

Duties of the keeper of the lighthouse?

Possibility of disastrous results in case of a single failure to perform them?

Persons selected with reference to what qualities of character?

Their kind of life? Stories told of particular ones?

Strength needful in the building?

Place where the people live?

Place of the light? Kind of light?

Who build and support the lighthouse?

2. The boat, why drawn so large? Because in the foreground. Real size how estimated? By the boy, whose size we know.

Distance of the lighthouse, that looks so near?

Kind of boat? Parts of the boat? Stern, bow, row-locks, hold, seats.

Ways of moving it? Rowing, sculling. Expressions and directions used by oarsmen? Kinds of boat for speed, for safety, for carrying merchandise?

Care to be taken of a boat?

3. Waves, why they cannot be drawn exactly? They are never still.

When is there surf? When white caps of spray? What lines best represent them?

Study the waves made by the boat.

4. The use of boating. Parts of the body exercised. Exercise it must also give to the memory and judgment to manage and use a boat, and take advantage of winds, tides, currents, and depth of water, character of bottom, channels, quicksands, landing-places, &c.

The *pleasure* of rowing analyzed.

The boy is moving his boat which way? Why does he row backward from himself?

### ORDER TO BE FOLLOWED IN DRAWING.

1. The rock on which the lighthouse stands: its water-line first.

2. The lighthouse.

3. Get the position of the water-line of the boat, and draw the stern and bow.

4. Draw a line through the middle of the top of the boat to mark the swell of the two sides; then draw them.

5. Find and draw any lines that are parallel to those which have been drawn.

6. The seats, ribs, rowlocks.

7. The cloud-lines, and the distant ships.

8. The post, rocks, vegetation, and shore-line.

9. The boy, and the oar in his right hand.

### THE SCHOONER.

1. Horizon-line.

2. The hull and bowsprit, calling attention to the places of greatest curve.

3. The masts. These must be wholly drawn; and such parts as are covered erased afterward.

4. The sails, in the order of jib, foresail, and mainsail.

5. Rigging, or ropes.

6. Details, such as stays, hoops, pennon, &c.

7. The waves, rocks, and lighthouse, and the distant ships.

When these patterns are drawn sufficiently well, let the

class draw boats and ships from memory, like these, or like any they have themselves seen. Encourage them to collect and study good pictures wherever found, and to observe especially the objects themselves.

### GENERAL SUMMARY.

After the series has been taken once, let it be reviewed, that each pattern may be made a matter of memory, so as to be reproduced anywhere. If any kind of models or actual specimens can be had, let the children try to draw from them, even if the results are not especially encouraging. The ideas of perspective measurement with the facility that must by this time be acquired in analyzing outlines, if made use of now in attempting any thing that is simple, will grow itself, and give pleasure and profit to the children as a recreation during the necessarily slow and elementary study of their systematic course in the drawing-books, which immediately follow.

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